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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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EXAMINER

WONG, ALLEN C

ART UNIT PAPER NUMBER

2613

DATE MAILED: 03/14/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/401,132

Applicant(s)

LEE ET AL.

Examiner

Allen Wong

Art Unit

2613

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 15 December 2005.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 22-30 and 32-50 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 22-30 and 32-50 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

Response to Arguments

1. Applicant's arguments filed 12/15/05 have been fully read and considered but they are not persuasive.

Regarding lines 1-3 on page 8 of applicant's remarks, the double patenting rejection, applicant has indicated that a terminal disclaimer will be filed when all other claim rejections have been resolved. Until then, the double patenting rejection will remain in effect at the present time.

Regarding lines 1-11 on page 10 of applicant's remarks, applicant asserts that Eleftheriadis does not disclose the determining a target frame bit rate for the frame, and Eleftheriadis does not disclose allocating the target frame bit rate in accordance with a target object bit rate as claimed in claims 22 and 32. The examiner respectfully disagrees. In column 11, line 53 to column 12, line 32, Eleftheriadis discloses that R is the frame bit rate, and R_i is the target average bit rate for each object, and a_i is the amount of total frame rate R , which is allocated to the object, while R_n is the amount of the total frame rate R , which is allocated to the background. Thus, Eleftheriadis teaches the determination of a target frame bit rate for the frame. Eleftheriadis' column 11, line 65 to column 12, line 19 asserts that equation 4 is used to determine the target frame bit rate, where part of the target frame bit rate is allocated as the target object bit rate, while the remainder is allocated as background target bit rate, the sum of the two being equal to the target frame bit rate R . Thus, Eleftheriadis teaches the allocation of the

Art Unit: 2613

target frame bit rate in accordance with a target object bit rate. Therefore, Eleftheriadis reasonably meets the broad limitations of applicant's present claims 22 and 32.

Regarding lines 27-28 on page 10 of applicant's remarks, applicant contends that Eleftheriadis fails to disclose the controller of claim 29 that is used for determining the target object bit rate from a target frame bit rate. The examiner respectfully disagrees. The limitation of determining the target object bit rate from a target frame bit rate has already been addressed above. Furthermore, in figure 16, Eleftheriadis discloses the use of "rate control" (ie. rate controller), for controlling the buffer overflow and underflow conditions for controlling the buffer occupancy, a concept that is necessary in any MPEG-2 or MPEG-4 video encoding system. Also, see figure 10, Eleftheriadis discloses the use of a rate controller 1040 for managing and monitoring the video data stored in buffer 1020, and rate controller 1040 can selectively adjust the quantization scale factor Q to prevent buffer overflow and underflow conditions for controlling the buffer occupancy, thus controlling the bandwidth of the video data bitstream and the target frame bit rate. Thus, Eleftheriadis reasonably meets the broad limitations of claim 29.

Therefore, the rejection is maintained.

Double Patenting

Claims 22-24, 27-30, 32-34, and 37-38 are rejected under judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1-13 of U.S. Patent No. 6,023,296. Although the conflicting claims are not identical, they are

Art Unit: 2613

not patentably distinct from each other because they are broader in scope. Allowance of these claims would give the applicant an undue timewise extension of monopoly.

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

2. Claims 22-30 and 32-50 are rejected under 35 U.S.C. 102(e) as being anticipated by Eleftheriadis (6,055,330).

Regarding claims 22, 32 and 43, Eleftheriadis discloses a method for allocating bits to encode each frame of an image sequence, each frame of said image sequence having at least one object, and a computer readable medium having stored thereon a plurality of instructions, the plurality of instructions including instructions which, when executed by a processor (col.15, ln.19-35), cause the processor to perform the steps comprising of:

determining a target frame bit rate for the frame (col.11, ln.53 to col.12, ln.32; Eleftheriadis discloses the frame bit rate R , and R_i is the target average bit rate for each object, and a_i is the amount of total frame rate R , which is allocated to the object, while R_n is the amount of the total frame rate R , which is allocated to the background);

allocating said target frame bit rate among the at least one object in accordance with a target object bit rate for the at least one object (col.11, ln.65 to col.12, ln.19; note equation 4 is used to determine the target frame bit rate, where part of the target frame bit rate is allocated as the target object bit rate, while the remainder is allocated as background target bit rate, the sum of the two being equal to the target frame bit rate R).

Regarding claims 23, 30, 33 and 44-46, Eleftheriadis discloses the use of the sum of the absolute differences, between two VOPs to obtain shape information, and further control the rate at which object information is processed (the mean absolute difference must be manipulated from the summing of the absolute differences).

Regarding claims 24, 34 and 40, Eleftheriadis discloses the buffer fullness (col.11, ln.53-64, buffer fullness is checked and monitored for buffer overflow or underflow).

Regarding claims 25, 35 and 47, Eleftheriadis discloses the use of shape information for both field or frame compression, and object-based compression (col.3, ln.26-30, syntax information, motion information, and shape information must be disclosed in object based compression).

Regarding claims 26 and 36, Eleftheriadis discloses other rate control techniques which assigns different bit rates to objects based on shape or depth information (col.19, ln.23-35).

Regarding claims 27 and 37, Eleftheriadis discloses quantization being dependent on a specific object and its attributes such as bit rates, etc. (col.10, ln.34-45).

Regarding claims 28 and 38, Eleftheriadis discloses the quantization for encoding object information (col.15, ln.19-35).

Regarding claim 29, Eleftheriadis discloses an apparatus for encoding each frame of an image sequence, said frame having at least one object, said apparatus comprising:

- a motion compensator for generating a predicted image of a current frame (fig.16, element 1640);

- a transform module for applying a transformation to a difference signal between the current frame and said predicted image, where said transformation produces a plurality of coefficients (fig.16, element 1650);

- a quantizer for quantizing said plurality of coefficients with at least one quantizer scale (fig.16, element 1651); and

- a controller for selectively adjusting said at least one quantizer scale for a current frame in response to a target object bit rate for the at least one object, wherein said target object bit rate is derived from a target frame bit rate (fig.16, note "rate control" is done a rate controller to control the buffer overflow and underflow conditions for controlling the buffer occupancy).

Regarding claim 39, Eleftheriadis discloses the target frame bit rate is determined from a remaining number of bits for the image sequence, a number of remaining frames in the image sequence, and/or a number of bits encoding a previous frame (col.11, ln.65 to col.12, ln.19; note equation 4 is used to determine the target frame bit rate, where part of the target frame bit rate is allocated as the target object bit

rate, while the remainder is allocated as background target bit rate, the sum of the two being equal to the target frame bit rate R).

Regarding claim 41, Eleftheriadis discloses the polynomial regression is used for recursively adjusting the target frame bit rate (col.11, ln.63 to col.12, ln.10, note the equation is used in a recursive manner and when the equation is expanded, it is expressed as a polynomial regression).

Regarding claim 42, Eleftheriadis discloses the estimation of complexity, deriving the predicted number of bits to code the frame from the estimated complexity and calculating the quantizer scale in accordance with complexity (fig.16, note the activity or complexity is estimated in motion estimation 1640, and that there the predicted values estimated based on the input information versus the predicted information to establish a proper coding bit rate, and then, the quantizer 1651 is then applied for properly adjusting the quantizer value in accordance with the complexity, based on the recursive coding process illustrated in fig.16).

Regarding claims 48 and 49, Eleftheriadis discloses the changing of bit numbers for shape coding (fig.16, note the number of bits can incrementally or decrementally adjusted for shape coding; and in col.3, ln.26-30, syntax information, motion information, and shape information must be disclosed in object based compression).

Regarding claim 50, Eleftheriadis discloses the at least one object comprises a plurality of objects (col.11, ln.53 to col.12, ln.19).

Conclusion

3. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Contact Information

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Allen Wong whose telephone number is (571) 272-7341. The examiner can normally be reached on Mondays to Thursdays from 8am-6pm Flextime.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, James J. Groody can be reached on (571) 272-7418. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Art Unit: 2613

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Allen Wong
Primary Examiner
Art Unit 2613

AW
3/2/06